

Measuring the Impact of Change on Laboratory Testing

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Abstract: This presentation covered the issue of changing population characteristics as well as the changing nature of health problems. There was a discussion of the health delivery system, the advent of managed care and its impact upon the delivery of health services. The influence of managed care on the clinical laboratory industry and the public health laboratory was also addressed.

The transition that the health care industry underwent during the 1980's served to modify dramatically the mind set of those in health care, from one based on a philanthropic orientation to a highly competitive business orientation. Almost overnight the industry has become market driven and consumer oriented.

Changing Population Characteristics

For the first time in history, western societies contain significant older populations, with characteristics and health attributes different from any other populations that have ever existed. At the same time that life expectancy at birth was increasing, approximately 75.8 years (72.3 for males, 79.1 for females), the age structure was also being transformed (today 11% of the population is ≥ 65 years).

Changing Nature of Health Problems

The nature of health problems in industrialized societies has changed dramatically during the 20th Century. During the turn of the century, major health problems were acute conditions (i.e., caused by disease agents in the environment, rapid

onset, all segments of populations were at equal risk, acute conditions were epitomized by the "killer" epidemic).

This century we have witnessed the disappearance of acute illness as the persuasive type of disorder and the emergence of the chronic condition, various conditions that are more frequently linked to lifestyle, heredity, and even psychological state; major examples include arthritis, cancer, rheumatism, hypertension, and diabetes. Once chronic conditions become predominant, the composition of the population becomes a powerful predictor of both health status and health behavior. It is interesting to note that approximately 50% of all deaths that occurred in 1990¹ could be attributed to several significant external and nongenetic factors (Chart 1).

Health Reform

In addressing the health problems in our populations and evaluating the impact of change on lab testing we must focus our attention on the health care delivery system and its dramatic evolution with the advent of managed care and the restructuring of the system which has now become a strategic

Actual Causes of Death in the United States in 1990

Cause	Deaths	
	Estimated No.*	Percentage of Total Deaths
Tobacco	400 000	19
Diet/Activity Patterns	300 000	14
Alcohol	100 000	5
Microbial Agents	90 000	4
Toxic Agents	60 000	3
Firearms	35 000	2
Sexual Behavior	30 000	1
Motor Vehicles	25 000	1
Illicit Use of Drugs	20 00	<1
Total	1 060 000	50

*Composite approximation drawn from studies that use different approaches to derive estimates, ranging from actual counts (e.g., firearms) to population attributable risk calculations (e.g., tobacco). Numbers over 100 000 rounded to the nearest 100 000; over 60 000, rounded to the nearest 10 000; below 60 000, rounded to the nearest 5 000.
Source: J.M. McGinnis & W.H. Foege, JAMA, Nov. 10, 1993, Vol. 270, No. 18.

Chart 1. Actual causes of death in the U.S., 1990.

imperative.

While it may have died on Capitol Hill in 1994, health reform is very much alive in individual states, and even accelerating in the private market place. The number of employees enrolled in managed care health, including PPOs, HMOs, and POS (Point of Service) jumped from 52% in 1993 to 63% in 1995. This is the biggest recorded increase in managed care enrollment during 9 years of surveys. The percentage of employees covered by traditional indemnity health plans, the most expensive option, fell to only 37% in 1995. This is the primary reason why medical inflation, measured at 4.9% in 1994, was cut almost in half since it hit a peak of 9.6% in 1990.²

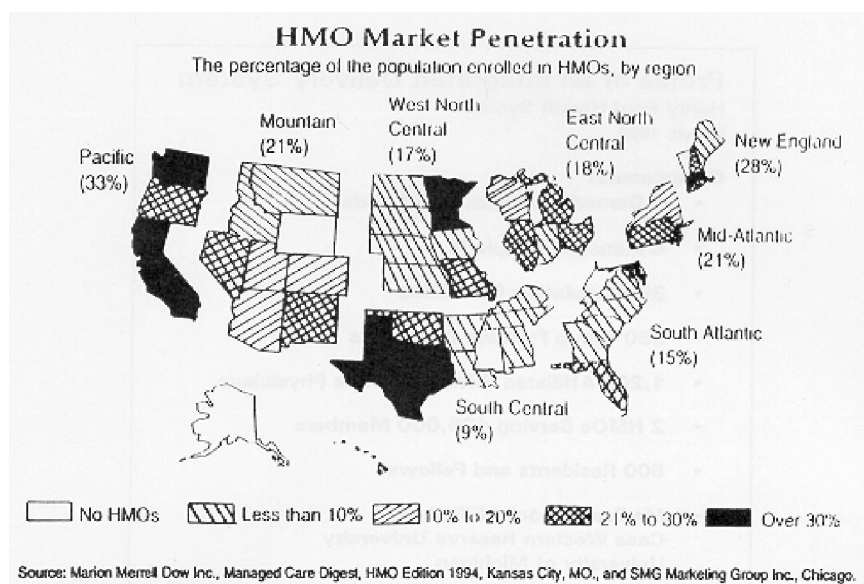
Throughout the country employers and individual states have seized the initiative to not wait for government to solve their cost problems, through the use of managed care plans and cost management technique.

Health plans are turning steadily to capitation to control their costs and share the risk with providers. As profit margins narrow and the price among providers becomes similar, the emphasis when selecting providers will be on quality.

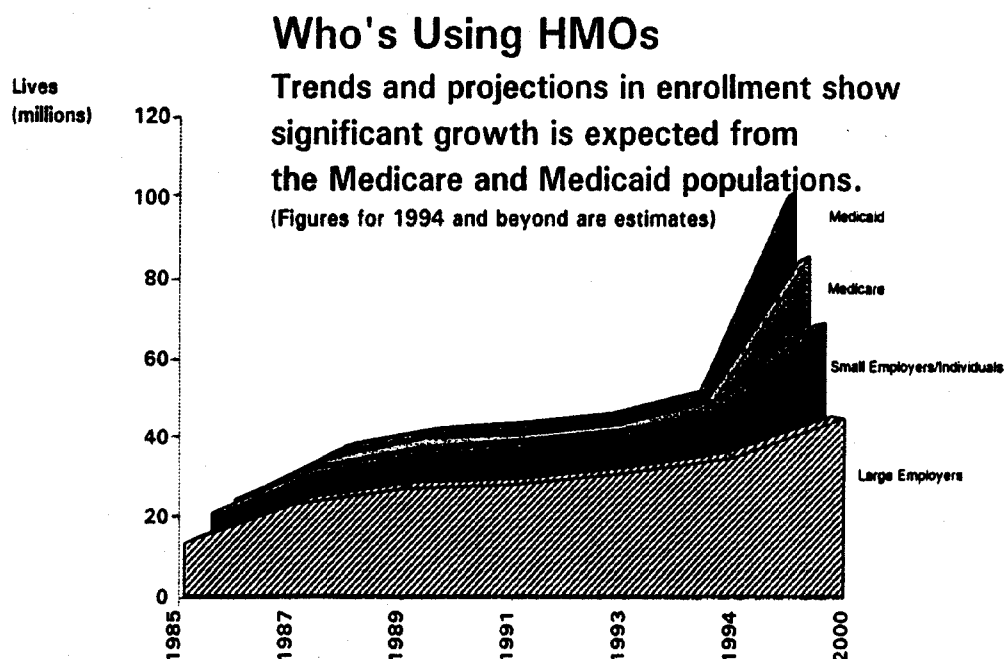
Graph 1 illustrates how HMOs have penetrated the market.

It is anticipated that the percentage of Medicare and Medicaid populations who utilize HMOs will grow significantly as illustrated in Graph 2.

A major initiative by HMOs has been the promotion of clinical practice guidelines, developed (Graph 3) either internally, obtained from medical specialty associations, or the AHCPR (Agency for Health Care Policy and Research), which has recently published a report translating their measure, and applications of those measure in quality of care standard setting, assessment, and improvement.⁴



Graph 1. HMO market penetration. The % of population enrolled in HMOs by region.



Graph 2. Use of HMOs by Medicare and Medicaid patients.

<p>Profile of an Integrated Delivery System Henry Ford Health System Detroit, 1995</p> <p>Components:</p> <ul style="list-style-type: none"> • 4 Owned Hospitals, 1537 beds • 4 Managed Hospitals • 36 Ambulatory Care Sites • 990 Group Practice Physicians • 1,200 Affiliated Private Practice Physicians • 2 HMOs Serving 435,000 Members • 500 Residents and Fellows • Medical School Affiliations Case Western Reserve University University of Michigan

Graph 3. Henry Ford Health System (Detroit, 1995) as an example of an integrated delivery system.

The falling hospital occupancy rates (Chart 2)⁵ and increasing outpatient revenues are forcing health care leaders to adopt new alternatives to outdated organizational models. Pressure has increased to consolidate, form networks, and right size delivery systems. More than 650 of some 6,500 of the nation's hospitals were involved in mergers or acquisitions in 1994; in comparison, only 71 hospital mergers were completed between 1990 and 1993 (source: American Hospital Association). The market's message to hospitals and their affiliates is simple: **REDUCE PRICES AND PROVIDE BETTER SERVICE** or risk going out of business. It is currently estimated that cost-containment systems spawned by managed care could force the closure of as many as 2,500 of nation's 6500 hospitals. In other words, "Holding on to old ways in this new and rapidly changing

environment is asking for extinction."

The "urge to merge" has grown so strong as a survival strategy that 81% of 1200 acute care hospitals said their hospitals would not be free standing within 5 years. To remain competitive and reduce costs, they indicated that they would join a network to share such services as laboratory facilities and information systems.

The march of managed care, new technologies, and alternative settings will prompt a 34% decrease in inpatient hospital days over the five years from 1994 to 1999, according to a new analysis by Sachs Groups. In the same period, discharges could decline by 26%, from 32.5 million to 24.2 million, the Sachs study suggests, while average length of stay could drop 11% from 6.1 for 5.5 days.⁶

The study also projected patterns from specific types of care:

Hospital Beds: The Declining Demand

An analysis of supply and demand in select Metropolitan markets in 1993 showed that only about half of current hospital beds will be needed by 2000

	Estimated Population (in millions)	Current Supply of Beds per 1000 people	Estimated demand for beds per 1000 people under current market conditions	Estimated demand for beds per 1000 people under managed care, year 2000
New York/Long Island	11.3	4.46	4.18	3.10
Los Angeles/Long Beach	9.1	2.90	1.93	1.54
Chicago	7.6	3.58	2.64	2.07
Boston/Nashua, NH	3.6	4.90	3.90	2.82
Philadelphia	5.0	3.46	2.96	2.42
Dallas/Fort Worth	4.3	2.78	1.73	1.47
Minneapolis/St. Paul	2.6	2.61	1.89	1.73
St. Louis	1.9	5.01	3.39	2.56
Miami/Fort Lauderdale	3.4	4.21	2.90	2.20
San Francisco	1.6	3.22	2.38	1.79

Source: Fox-Pitt, Kelton, New York, 1994.

Chart 2. 1993 analysis of the demand for hospital beds in selected metropolitan areas.

*Ambulatory facilities will eliminate many surgical inpatient days, with orthopedics dropping 38% to 10.5 million and general surgery down 150% to 13.9 million days.

*Use of birthing centers will increase, and many new mothers and healthy newborns will be in hospitals for stays averaging 12 hours that won't count as discharges. Thus, OB discharges will decline 30% from 3.9 million to 2.7 million, while length of stay will drop from 2.6 to 2.1 days.

*Although there will be an 11% increase in HIV patient discharges from 121,000 to 134,000, length of stay will decline 25% from 12.2 to 9.2 days as use of hospices expands.

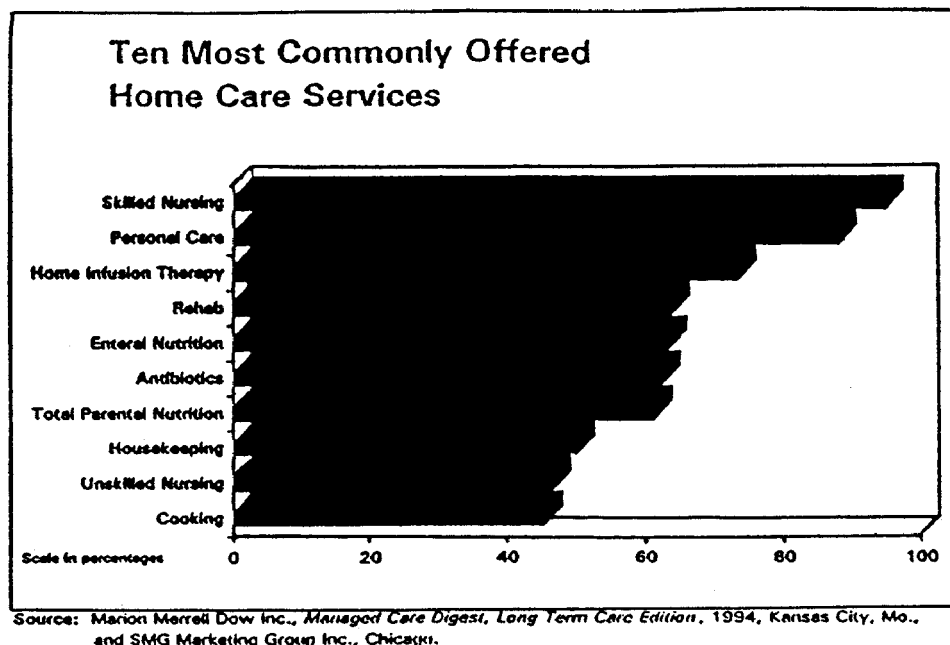
*Mental health care will be delivered

more often in residential settings such as halfway houses, eliminating nearly a million psychiatric discharges for a decline of 59% and new total of 712,000. This is the biggest projected decline, in both percent and absolute numbers, for any type of care.

The trend toward integrated delivery systems is also occurring in response to employer and other health care buyer demands for lower health care costs, for health care that emphasizes prevention and wellness and for one-stop-shopping that guides patients to the most appropriate settings for medical care. A profile of an integrated delivery system is the Henry Ford Health System (Graph 3).⁷

Home Health Care

The most dramatic and fastest growing



Graph 4. Ten most commonly offered home care services.

segment of the health care industry combines cost-effective, high quality care and the comforts of home (Graph 4).⁸

The graying of America, efforts to control increasing medical costs, and advances in technology that make sophisticated patient care more mobile are all contributing to the growth of home health care.

According to the Health Care Financing Administration (HCFA), home health here grew by 23.8% in 1993 as compared with 7.8% for health care as a whole. Based on government figures for 1994, average home health charges per visit were \$83, skilled nursing facilities charges per day were \$284, and an average hospital stay was \$1751 per day.

Impact of Change Upon Laboratory Testing

We will now focus on the kind of

dramatic changes that are occurring right now in the laboratory (lab) industry. Two excellent publications that continue to monitor this are: The Medical Laboratory Observer and Dennis Weissman's Industry Report on Laboratories. The following discussion reviews the latest survey results that are published on the impact of Managed Care, particularly on the hospital labs and the changes that are occurring there.

There is no question that larger referral labs, primarily commercial labs, will soon begin processing the vast majority of tests. A survey that conducted of MLO's advisory panel--primarily laboratory managers--strongly believe that much of the work will eventually transfer out of the hospital and into the commercial setting. Managed Care obviously is putting a lot of pressure to cut costs. 44% of survey participants wonder what the impact is going to be upon the laboratory (Figure 1). 24% do believe that

◦ Due to increasing emphasis on lowest possible costs, large referral labs will soon process the vast majority of tests.	52%
◦ Managed care is putting so much pressure on laboratorians to cut costs and boost productivity, lab operations are being compromised.	50%
◦ It's too early in the game to predict what future impact managed care will have on health care and the lab.	44%
◦ Managed care is a welcome sight, as it controls the overutilization of lab services, particularly expensive, esoteric testing.	24%
◦ Managed care will ultimately require most patient testing be done at the point of care.	18%
◦ Managed care will ultimately send most technologists to the unemployment line.	17%
◦ Managed care will create new and exciting job opportunities for technologists, offering laboratorians more patient contact.	16%

Figure 1. Managed Care's impact on the clinical laboratory. (Source: MLO, September, 1995)

Managed Care is a welcomed sight since it controls overuse of laboratory services--particularly expensive, esoteric tests. Ironically, when I began interacting with the private sector in our state, many of the people on our advisory council felt very strongly about this. It is time that there be a system that begins to focus on the over-utilization of laboratory testing.

Another evolving area, of course, is that Managed Care will ultimately require that patient care and patient testing be done at the point-of-care. Managed Care will ultimately send most technologists to the unemployment line. I can tell you in Washington during 1993-94 there was major downsizing of both hospital laboratories and certainly of the Public Health Laboratory. Whether many of these workers went to unemployment and then were recycled into other careers, we don't know, but Managed Care will definitely have impact upon your

FTEs.

Other trends in the lab that have been a major outcome, so far, of Managed Care: Financial management is now paramount. It goes without saying that more lab workers are being cross-trained. Regulatory burdens are increasing. What impact is regulation having upon the laboratory? Right now a very anti-regulatory movement exists in the state of Washington. In fact legislation has been introduced with appropriate FTEs to re-examine the government regulation environment in our state. It wouldn't surprise me that, in fact, we may introduce some proposals about the way that we address licensure of clinical laboratories. We're the first state in the country with CLIA deemed status. Thus, we may also lead the way in the country in reforming regulation of laboratories.

More laboratorians are becoming involved in information management. I was

1	9%
2 - 3	19%
4 - 5	11%
More than 5	20%
None	12%
Unsure	29%
Mean	3

Figure 2. Number of Managed Care contracts that a hospital lab might have. (Source: MLO, September, 1995)

astonished to find that most laboratories in our state have a very good internal information management system but very few of them are connected to the outside world. We're going to try to do something to change that.

Figure 2 depicts the number of Managed Care contracts that a hospital laboratory might have; an average of about 3 Managed Care contracts.

Figure 3 indicates that stress among staffs is leading to the loss of valuable workers. I've seen this personally. For several friends who were in management positions, the stress has been overwhelming as we've gone through this transition and change. Personnel are being let go. Fewer QC and QA initiatives are being implemented as a result of Managed Care. This is certainly something that ought to be examined. Some of the survey respondents indicate that there

are no negative effects. Others say that more testing errors are being made.

Laboratories are responding by acquiring instrumentation with greater versatility and increasing automation (figure 4). Cutback in total FTEs and major downsizing of laboratories particularly of management staff are common. There is a reduction of Medical Technologists which ultimately, of course, will extend Medical Laboratory Technicians. There is a lot more focus on self-directed work teams. Discontinuing certain tests and implementing bar code systems are improving efficiency.

Now this was something I thought was rather interesting (Figure 5). There's been a 35% introduction of practice guidelines for laboratory use. Panels and profiles have been reduced by 60%. About 40% of physicians and nurses are following stricter ordering protocol. More tests batched.

Stress among staff is leading to the loss of valuable workers.	51%
Personnel are being let go.	27%
Fewer QC/QA initiatives are being implemented.	22%
No negative effects have been experienced.	21%
More testing errors are being made.	20%
Our physical space has been cut back, forcing us to work in cramped quarters.	13%
Other	18%

Figure 3. How Managed Care affects the laboratory. (Source: MLO, September, 1995)

Acquiring instrumentation with greater versatility, throughput and TAT capabilities	69%
Cutting back on total FTEs, but retaining staff able to perform diverse responsibilities	53%
Reducing/discontinuation certain tests	45%
Implementing bar code systems	44%
Installing advanced laboratory information systems	43%
Sending more tests to outside labs	24%
Reprogramming physicians, through revised lab protocols, to practice conservative medicine	23%
Moving more testing bedside	15%
Hiring utilization experts to help revamp department procedures.	10%
Other	8%

Figure 4. The laboratory's response to Managed Care pressures. (Source: MLO, September, 1995)

Laboratories have become part of a integrated system	57%
Facility is part of a multi-hospital group/affiliation	55%
Facility is part of a physician-hospital organization	51%
Facility associated with independent physicians association	5%
Facility associated with national, for-profit chain	4%

Figure 5. Integrated health care systems. (Source: MLO, September, 1995)

Change in Practice Guidelines	35%
Panels and Profiles have been Revamped	60%
Physicians and Nurses Follow Stricter Ordering Protocols	40%
More Tests are being Batched	38%
State Protocols have Changed	29%

Figure 6. Impact on practice guidelines. (Source: MLO, September, 1995)

Laboratories have undergone major reorganization	42%
Restructuring has resulted in staff reductions	77%
Lab sections have been realigned to facilitate teamwork	63%
Management structure has been changed	62%
Labs consolidated or merged with outside labs	19%
Labs merged with other labs within their own facilities	18%

Figure 7. Reorganization of laboratories. (Source: MLO, September, 1995)

Dr. Steiner will cover the subject of networks and integration. 57% of laboratories have indicated that they're part of an integrated system (Figure 6). About 42% say that their laboratories have been reorganized and they're restructuring, which has resulted in staff reductions (Figure 7). There was recently a consolidation of a major medical center in Seattle with Group Health which is one of the prominent HMOs in the country and which is going to impact substantially the pathology staff and at the administration level with a consolidation of responsibility.

So what are some of the anticipated changes that we might see in the future clinical laboratory system? (Figure 8)

Certainly the role of laboratory medicine will be expanded into promoting health, into prevention. There's going to be a major focus for the role of the clinical laboratory. The growth in home health care will promote

home testing and increase direct public access to preventive and screening testing. A number of states have begun considering alternatives for the public to use and increase direct access to the clinical laboratory. This has certainly gone through some changes. Genetic testing obviously is going to be expanded. It is anticipated that by the year 2025 that all human ailments that have a genetic link will be identified and mapped in labs. Laboratories will also support preventive medicine.

Hospital and clinical labs will play a much more active role in the nation's disease surveillance, with an increase of laboratory reporting by electronic technology. This is something that we are extremely interested in Washington. We are in the process of implementing such a program. The first pilot project will be with Group Health which has about 500,000 members-- and once we evaluate that, this will move statewide.

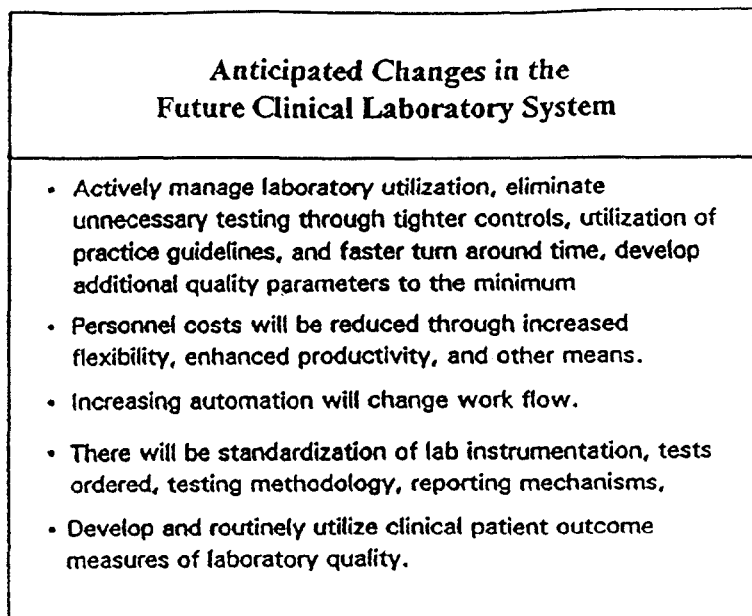


Figure 8. Anticipated changes in the future clinical laboratory system.

Obviously, once you develop an electronic network between hospital clinical labs and the public health system, then the potential for what can be accomplished is left to your imagination as to the type of electronic network you can develop in the future. Several states are now beginning to look at an integrated electronic communication infrastructure to examine utilization, patient outcomes, and so forth. This is obviously the future in laboratories as a producer of data. There's a tremendous amount of information in that data and obviously they're going to be a key component of any kind of state initiative around electronic networking.

It's going to be very important to focus on laboratory utilization, eliminating unnecessary testing through tighter control and utilizing practice guidelines. In your individual states you have a responsibility to step forward in a coalition and insure that the practice guidelines that are developed in your

state are the ones that you want implemented. These are important issues of public policy, and our experience has been that when you bring together laboratory leadership from all areas, we in fact can develop this in a consensus process that can be very acceptable to the laboratory and physicians.

Personnel costs will be reduced with increased flexibility, mass productivity, automation.

Figure 9 is a comparative chart that was recently published by Dennis Weissman showing the trends in hospital and independent physician office lab which basically substantiates what the MLO survey results were: Hospital reduction in testing, industry consolidation, lower test utilization, independent labs more pressure to reduce costs, fewer total companies, obviously acquisition activity among the national and regional labs. In POLs there is less testing

Laboratory Industry Trends By Market Segment			
Trend	Segment		
	Hospital	Independent	POL
Managed Care Growth	Reduction in routine and in-patient testing; more outreach and outsourcing in some institutions; push for cost-effectiveness and staff reductions	More pressure to reduce costs and prices; more capitation and contract bidding	Less POL testing overall and more limited menu of procedures
Industry Consolidation	Growth in vertical integration, regional systems and networks; more partnerships among hospitals and independents	Fewer total companies including small and medium-size labs; merger & acquisition activity among national and regional labs has peaked	Fewer solo POLs and more large group practice labs
Lower Test Utilization	Outpatients, outreach testing varies depending on market positioning; in-patient testing is down as length of stay decreases; when physician practices are purchased, more in-house work is captured	Capitated environment rewards less testing; Medicare utilization dropped by 8.9% in 1994; national labs have been forced by government to modify billing of panels; tougher local medical review oversight	Reduced test menu due to market & regulatory conditions; more waived procedures because of CLIA; Medicare spending dropped by 12% in 1994

Figure 9. Laboratory industry trends by market segment.
(Source: Lab Industry Report, Vol IV, no 4, July/August, 1995)

Impact of Managed Care Upon Public Health Laboratories	
<ul style="list-style-type: none"> • Routine screening for STDs and HIV will transition to hospital/commercial laboratories • Public health will focus their resources on disease surveillance, outbreak investigation, monitoring emerging infectious diseases • Other priorities will be technology transfer, technical consultation and training, monitoring of quality assurance in hospital, commercial and physician laboratories • Dissemination of information on laboratory methodology, molecular epidemiology data on public health significant microorganisms, laboratory practice guidelines on infectious diseases 	

Figure 10. Impact of Managed Care on public health laboratories.

going on.

What's going to be the impact on the Public Health Laboratory? I've already alluded to one area where I think we have a significant role in health reform/managed care, to bring people together, to help establish public policy. That is one of the mandated roles of public health. There are other activities, however, where I see a dramatic change in public health as a result of Managed Care (Figure 10). HIV and STD screenings, for the most part, have been done through the public health system, whether it is local Health Departments/ Family Planning / Planned Parenthood/ Local Community Clinics. That population is beginning to move over to organizations that provide Managed Care. Some County Health Departments are not only going to stay in primary care, they are also going to extend it. They're looking at going into Managed Care themselves.

Public health is going to focus our resources on disease surveillance and outbreak investigation. A major task that we have is looking at emergent infectious diseases and not only having the laboratory capacity to focus on that, but again bringing the laboratory community together to see the role of hospital and the commercial laboratory around this issue.

Other priorities will be: technology transfer, technical consultation and training, monitoring of quality assurance in hospital, commercial, and physician laboratories. Very much a traditional role that we've always had. We've been asked to pick up that role in Washington because, again the training available for hospitals has really suffered because of lack of funding. And, of course, now we're being asked to extend our training to point-of-care testing and non-laboratorians that are doing that kind of

testing.

Another major role you can anticipate from public health laboratories will be dissemination of material on laboratory methodology not only in microbiology, but throughout the clinical laboratory. We are beginning to become the depository for information on laboratory methodology and comparative studies that are ongoing within hospitals and commercial laboratories. Perhaps we could serve as a central point for disseminating that information through the laboratory.

There will be a major focus in the area of Molecular Epidemiology, the kind of data that we produce as well as the kind that is produced in the hospitals and clinical labs and re-emphasizing our role as a reference lab.

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